

Analysis the Role of Private Entities in the Energy Sector of Bangladesh

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To cite this article:

Mahadehe Hassan. Analysis the Role of Private Entities in the Energy Sector of Bangladesh. *Journal of Energy, Environmental & Chemical Engineering*. Vol. 6, No. 3, 2021, pp. 76-87. doi: 10.11648/j.jeece.20210603.15

Received: August 15, 2021; **Accepted:** August 27, 2021; **Published:** September 4, 2021

Abstract: In the context of globalization and open market economy, there is no alternative to the discovery of energy and mineral resources of Bangladesh and its proper management and planned use. Besides, Bangladesh is committed to the implementation of the Sustainable Development Goals (SDGs) 2030 announced by the United Nations and the government is setting the targets for the implementation of the SDGs in the light of the 8th Five-Year Plan. That is why uninterrupted fuel supply is required. The present government has identified the energy sector as a priority sector, realizing the necessity of energy sector development. The role of private companies is essential to meet the country's growing energy demands as well as to move from a mid-income country to a developed country. Therefore, this study analyzes the role of private entities in the energy sector of Bangladesh. The research focuses on the following points: (i) Economic rebound through Covid-19 scenario in Bangladesh; (ii) Contribution of private entities to the energy sector of Bangladesh (iii) Challenges faced by private entities in energy sector of Bangladesh (iv) Prospects of private entities in energy sector of Bangladesh (v) private entities to enhance energy security.

Keywords: Energy, Electricity, Role of Private Entities, Economic Growth

1. Introduction

The Present government has identified the energy sector as a priority sector realizing the importance of energy sector development. Energy and Mineral Resources Division and its subordinate organization have undertaken various constructive and fruitful activities to achieve full security in the energy sector by achieving the Sustainable Development Goals (SDGs) 2030, Vision-2021 (Middle income Country) and Vision-2041 (Status of a developed Country) working diligently.

The energy sector is a capital-intensive sector. The development of this sector requires a lot of investment. Since development in the public sector along is a difficult task, the Energy and Mineral Resources Division has formulated various policies to involve the private sector in the development of the sector. Notable among these:

- 1) LPG Bottling Plant Establishment Policy, 2016
- 2) Liquefied Petroleum Gas (Auto Gas) refueling station and conversion workshop establishment, operation and maintenance policy, 2016

- 3) Policies for setting up and operating bioethanol plant, 2017

- 4) Lube Blending plant establishment policy, 2018

- 5) Private petrochemical plant establishment and management policy, 2019

- 6) Construction, Import and Supply policy of LNG installation in private sector, 2019

- 7) Purchase and installation of prepaid/ smart gas meters from open market at residential level policy, 2019

Many non-governmental organizations have been involved in this sector and have been making significant contributions for last 10 (Ten) years

At present 25 (Twenty-five) companies including Bashundhara LP Gas company Ltd, Jamuna LP Gas company Ltd, Omera LP Gas company Ltd, TK LP Gas company Ltd, Orion LP Gas company Ltd, Promita LP Gas company Ltd, Navana LP Gas company Ltd, Sena LP Gas company Ltd, Beximco LP Gas company Ltd, etc. marketing the Liquid petroleum gas (LPG).

Among the top five companies in the lubricants market in Bangladesh are MJL Bangladesh, British Petroleum PLC

(including Castrol), Total, Caltex and Royal Dutch Shell.

The two companies involved in LNG imports are Summit LNG Terminal Company Limited and Accelerate Energy Bangladesh Limited.

Their combined efforts will play an important role in ensuring energy security of the country

2. Bangladesh's Economic Rebound Through COVID-19

2.1. Bangladesh Economic Performance in COVID-19

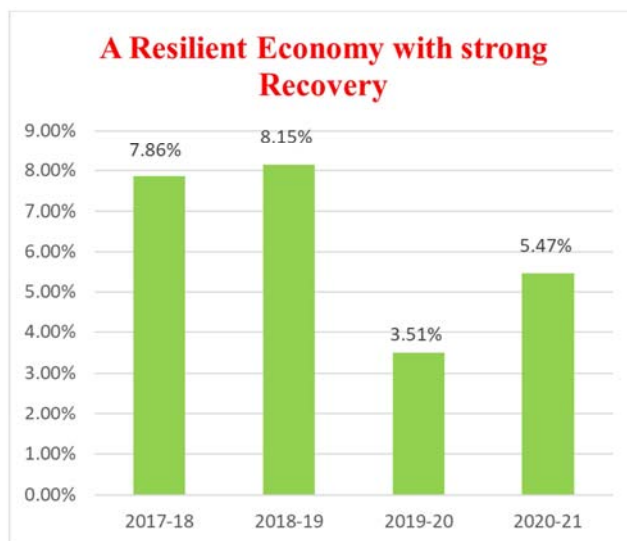
Economic performance GDP growth increased to 8.15% in FY2018- 2019 from 7.86% in the previous year on robust growth in industry and services Growth in industry rose from 12.1% in FY 2018 to 12.7% in FY 2019, reflecting brisk growth in manufacturing output to supply markedly higher export demand, notably to the US and some previously unpenetrated markets. Growth in services increased from 6.4% to 6.8% mainly on improvements in wholesale and retail trade, transport, education, and health and social services. Agriculture growth moderated from 4.2% to 3.9%. On the demand side, growth in FY 2019 was buoyed by robust growth in exports. Private investment expanded, though at a slower pace than a year earlier, while public investment remained steady. Total investment increased from the equivalent of 31.2% of GDP in FY 2018 to 31.6% as private investment increased from 23.3% of GDP to 23.5% and public investment remained unchanged at 8.0%. Inflation moderated from 5.8% in the previous year to average 5.5% in FY 2019 with lower domestic rice prices following a good harvest and lower food prices on the international market (While food inflation eased, nonfood inflation moved a bit higher owing to upward adjustments in natural gas prices and currency depreciation. Growth in broad money accelerated from 9.2% in FY 2018 to 9.9% but remained well below the FY 2019 monetary [2].

After years of steady advances, GDP growth declined in fiscal year 2019-2020 as the COVID-19 pandemic upended economic activity globally. Disruption to supply chains pushed inflation slightly higher but remained under control, and the current account deficit narrowed. Assuming prudent macroeconomic management and proper implementation of timely announced stimulus packages to mitigate the impact of COVID-19, GDP growth is expected to pick up, inflation to moderate, and current account deficit to narrow further in FY 2021 [1].

2.2. A Resilient Economy with Strong Recovery

GDP grew by 5.47% in FY 2020-21, according to preliminary official estimates. This is significantly less than the ADO 2020 projection published in April and down from 8.15% growth achieved in FY2018-2019. The spread of COVID-19 globally, especially in major trade partners, affect the Bangladesh economy in the final quarter of FY 2019-2020. Containment measures enforced by the government from 26 March limited the movement of people and goods

within the country and across borders, further impairing economic performance. Exports and imports contracted significantly, and remittances, which grew by more than 20% in the first 8 months, were hit hard in March–May 2020. Moreover, mobility constraints substantially cut back consumer demand. Consumers' uncertainty and lack of confidence scuttled plans for business expansion and investment, further constraining domestic demand [1].



Bangladesh's GDB Growth rate % vs Fiscal Year [4]

Figure 1. Resilient Economy with strong Recovery.

2.3. Annual Economic Growth (\$ Billion)

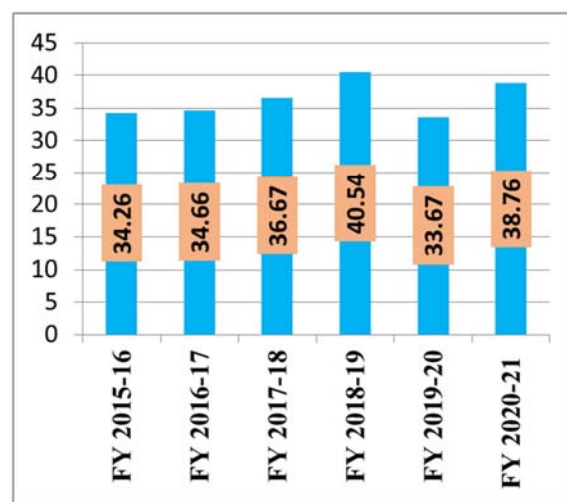


Figure 2. Annual Economic Growth in Bangladesh [5].

Due to the effective measures undertaken by the government of Bangladesh under the dynamic leadership of Honorable Prime Minister Sheikh Hasina:

- 1) the economy is on track towards making a sharp rebound.
- 2) industries have been able to achieve 70-80% recovery despite COVID impact
- 3) Bangladesh's export earnings have reached USD 33.67

billion despite its initial decline, it is reached USD 38.76 billion in 2020- 2021

- 4) the flow of credit to the private sector is slow but it is growing consistently
- 5) After a long time, Bangladesh's capital market has returned to a bullish trend. aside from the gains in the key index, trading in the country's premier bourse has also seen an upturn, buoyed by renewed optimism among investors

2.4. Economic Growth in South Asian Countries

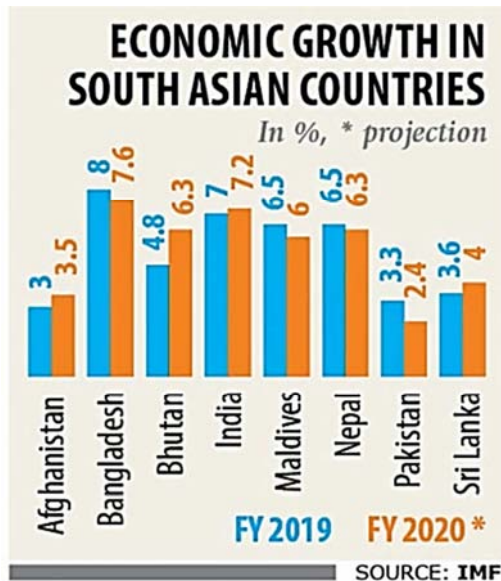


Figure 3. Economic Growth in South Asian Countries [3].

- 1) The inflow of remittance, which was expected to drop, is now on an upward trajectory
- 2) Bangladesh bank's foreign currency reserve has crossed \$42 billion for the first time
- 3) Bangladesh is currently posting a surplus in its balance of payments resulting low inflation despite huge public spending on infrastructure projects

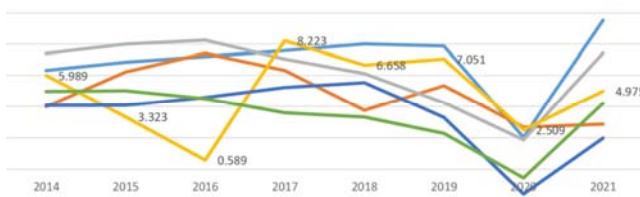


Figure 4. Economic growth in South Asian Countries (2014-2021) [3].

Above Figure shows that the economic growth in all the South Asian countries slumped in 2020; while the economic growth remained positive for most of the countries including Bangladesh, Nepal, Pakistan and Sri Lanka are the two countries that experienced negative economic growth. This erratic fluctuation in economic growth indicates that almost all macroeconomic variables have been affected due to COVID-19 [11].

3. Contribution of Private Entities to the Energy Sector of Bangladesh

3.1. Natural Gas

Since first discovery in 1955 as of today 26 gas fields, 24 in the onshore and 2 in the offshore have been discovered in the country [7]. Of them 20 gas fields are in production, one offshore gas field have depilated after 14 years of production while other offshore field has not been viable for production due to small reserve. The estimated GIIP (Proven plus Probable) recoverable reserve was 40.09 Tcf. Of them recoverable (Proven plus Probable) 30.06 Tcf [8]. As of June 2021, a total of 18.69 Tcf gas has already been produced leaving only 11.37 TCF recoverable reserve in proven plus probable category [9].

Table 1. At a glance of Natural gas sector in Bangladesh.

Description	Data
Total number of gas fields	26
Number of gas fields in production	20
Number of producing wells	112
Present gas production capacity	2750 MMCFD
Avg. gas production rate	1744-2752 MMCFD
Avg. gas production/day	2978 MMCFD
GIIP (Proven + Probable) Reserve	40.09 TCF
Total recoverable (Proven + Probable) Reserve	30.06 TCF
Cumulative production (June, 2021)	18.69 TCF
Remaining reserve (Proven + Probable)	11.37 TCF
Annual Production by NOC	299.12 BCF (34%)
Annual Production by IOC	593.05 BCF (66%)
Present Demand	3508 MMCFD
Present Deficit	530 MMCFD (along with LNG)
Number of customer	43 lakh (appx.)

Source: HCU Data Bank

Some key information about the historical natural gas production 2009-2021 sector is presented in below:

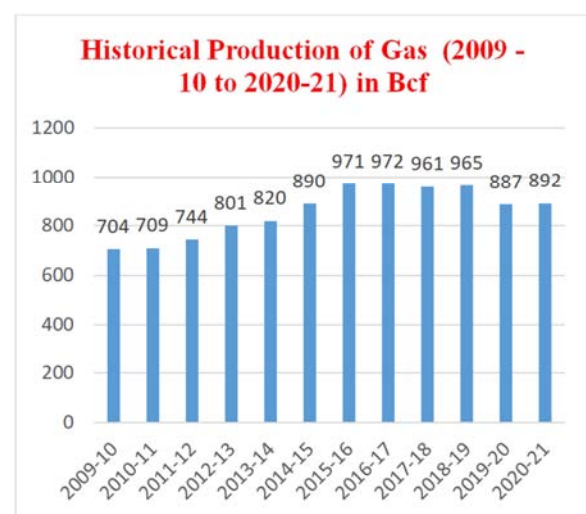


Figure 5. Historical Gas Production in Bangladesh.

Although natural gas was introduced as commercial fuel in

early 1960s, [7] its consumption got real momentum in eighties marking the beginning of the industrialization in the country.

Table 2. Year-wise Production of Natural Gas by Private companies in Bangladesh.

Year	Private	Public	Total
2016-2017	582.78	389.28	972.06
2017-2018	575.43	385.34	960.77
2018-2019	588.64	376.10	964.74
2019-2020	559.76	327.18	886.94
2020-2021	593.05	299.13	892.18

Source: HCU Data Bank

Table 3. Year-wise contribution of Private Companies Natural Gas Produced in Bangladesh.

Year	Private	Public	Total
2016-2017	59.95%	40.05%	100%
2017-2018	59.89%	40.11%	100%
2018-2019	61.02%	38.98%	100%
2019-2020	63.11%	36.89%	100%
2020-2021	66.47%	33.53%	100%

As can be seen from the Table above, Private companies produced 60%-66% of the total Natural Gas in Bangladesh every year. Therefore, the role of private companies in Natural Gas production is very important in the energy sector of Bangladesh.

3.2. Liquefied Natural Gas (LNG)

To meet the growing energy demand of the country, the government initiated the import of LNG from abroad. At present, a total of 1000 MMCFD LNG is added to the national grid [12].

Floating LNG Terminal:

- 1) Agreement with Excelerate Energy, Singapore has been signed for setting up FSRU. Already, floating LNG terminal has been installed in Maheshkhali in Cox's Bazar district. Currently, daily 500 MMcf re-gasified LNG is added to the national grid by Excelerate Energy.
- 2) SUMMIT LNG Terminal Co. (Pvt.) Ltd. has signed the Agreement (BOOT) to set up FSRU at Maheshkhali in Cox's Bazar district with a capacity of supplying daily 500 MMcf re-gasified LNG. 500 MMcf re-gasified LNG is added to the national grid since April 2019.

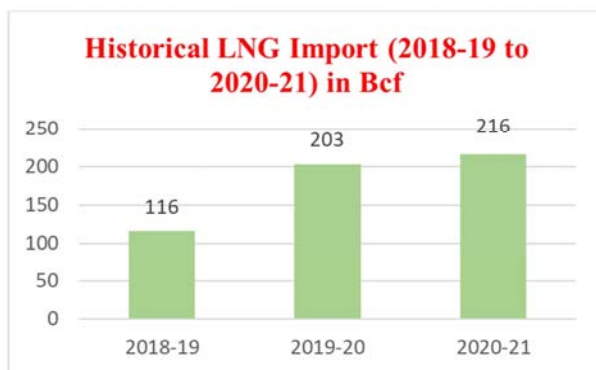


Figure 6. Historical LNG Import in Bangladesh.

Table 4. Year-wise LNG Import in Bangladesh (Bcf).

Year	MLNG	SLNG	Total
2018-2019	106.03	9.85	115.89
2019-2020	102.86	100.02	202.88
2020-2021	100.60	115.50	216.10

Source: HCU Data Bank

Table 5. Year-wise contribution of Private companies LNG Import in Bangladesh.

Year	MLNG	SLNG	Total
2018-2019	91.49%	8.51%	100%
2019-2020	50.70%	49.30%	100%
2020-2021	46.55%	53.45%	100%

As can be seen from the Table above, in the Fiscal Years 2018-2019, 2019-2020 and 2020-2021 Excelerate Energy company imported 91.49%, 50.70% and 46.55% of the total Liquefied Natural Gas (LNG) and SUMMIT LNG Terminal Co. (Pvt.) Ltd imported 8.51%, 49.30% and 53.45%. Therefore, the role of private companies in Liquefied Natural Gas (LNG) import is very important in the energy sector of Bangladesh

3.3. Liquefied Petroleum Gas (LPG)

Liquefied Petroleum Gas (LPG) is a burning fuel derived from condensates or crude oil (gas fields/ refineries) widely used as a green fuel for cooking, heating, industrial applications, automotive sector & plastic production etc. LPG is an alternative to burning wood & kerosene, this promotes afforestation & clean kitchens safer to use than natural gas, CNG or kerosene. It is mixture of Propane & Butane (c3 & c4) & its calorific value (~46.1 mj/kg).

At Present Liquefied Petroleum Gas (LPG) is being used everywhere in Bangladesh:

- 1) Cooking fuel for households & residential townships
- 2) Cooking fuel for hotels, commercial establishments, cafes & restaurants
- 3) Heating & burning fuel for small to large scale industry
- 4) Fuel for captive power generation
- 5) Automotive fuel (Auto gas) as an alternate to CNG
- 6) Fuel for aiding Construction & Shipyards (welding, heating, etc.)
- 7) Reticulation system (LP gas supply by pipeline)

Table 6. Current Scenario of Bangladesh LPG Market [13].

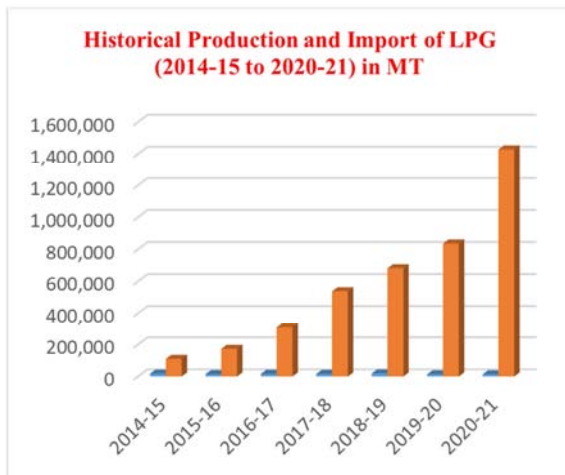
Description	Data
2020-21 Local LPG Production	0.92%
Local Producers	ERL and RPGCL
2020-21 LPG Import	99.08%
Import Terminals	20 Nos
Dealers	3,000 Nos
Retailers	38,000 Nos
LPG cylinders in market	30,000,000 Nos
2019-20 Bangladesh LPG Import volume	835,027MT
2020-21 Bangladesh LPG Import volume	14,27,826 MT
Market growth rate	14.6%

Source: HCU Data Bank

Table 7. LPG scenario of last 5 year (MT).

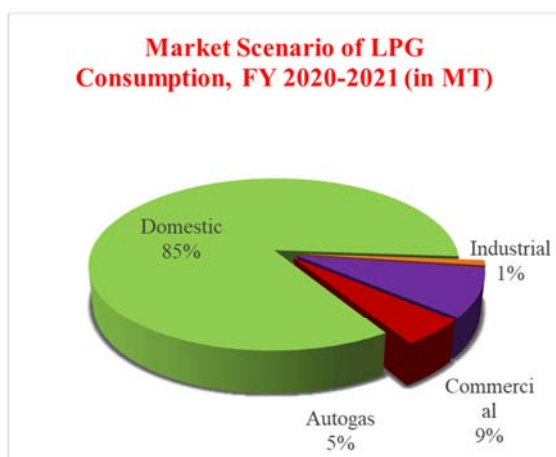
Year	Production	Import	Total
2014-15	17,574	110,000	127,574
2015-16	14,000	172,792	186,792
2016-17	16,382	307,000	323,382
2017-18	15,936	537,686	553,622
2018-19	19,228	681,036	700,264
2019-20	13,414	835,027	848,441
2020-21	13,207	1,427,826	1,441,033

Source: HCU Data Bank

**Figure 7.** Historical Production and Import of LPG Private and Public companies in Bangladesh.**Table 8.** Market Scenario of LPG Consumption, FY 2020-21.

No.	Items	Amount (MT)
1	Domestic	1,224,878.00
2	Industrial	14,410.00
3	Commercial	129,693.00
4	Auto gas	72,052.00
Total		1,441,033.00

Source: HCU Data Bank

**Figure 8.** Consumption of LPG Market Scenario in Bangladesh 2020-2021.**Industrial Purpose:**

- 1) Ceramic Industry
- 2) Motor Cycle Industry
- 3) Bicycle Industry

- 4) Steel Industry [Preheating Unit of BSRM, KSRM etc.]
- 5) Insulating Foam (For Steel Structures) producing plant
- 6) Tea Processing Plant
- 7) Aerosol Industry

Commercial Purpose

- 1) Hotel
- 2) Restaurant
- 3) Condominium

Table 9. Year-wise contribution of Private companies LPG Import in Bangladesh.

Year	Public	Private	Total
2014-2015	13.78%	86.22%	100%
2015-2016	7.49%	92.51%	100%
2016-2017	4.07%	94.93%	100%
2017-2018	2.88%	97.12%	100%
2018-2019	2.75%	97.25%	100%
2019-2020	1.58%	98.42%	100%
2020-2021	0.92%	99.08%	100%

As can be seen from the Table above, in the Fiscal Years 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019, 2019-2020 and 2020-2021 Private companies imported 86.22%, 92.81%, 94.93%, 97.12%, 97.25%, 98.42% and 99.08% of the total Liquefied Petroleum Gas (LPG) and Public Company produced 13.75%, 7.49%, 4.07%, 2.88%, 2.75%, 1.58% and 0.92%. Therefore, the role of Private companies in the import of Liquefied Petroleum Gas (LPG) is very important in the energy sector of Bangladesh.

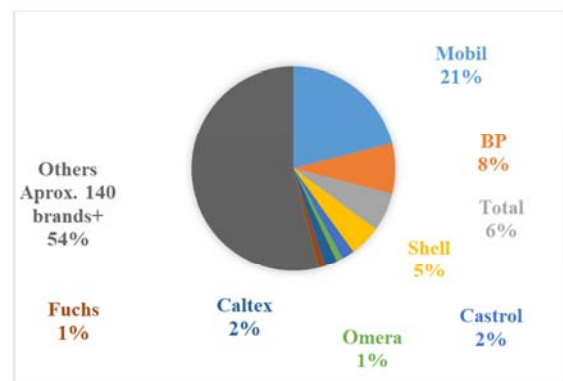
3.4. Lubricating Oil

Market Scenario of lubricating oil in Bangladesh

Total Market Size of lubricating oil in Bangladesh: ~ 130 million liters (2019) & monetary value around: BDT 3,500 core. Major users of lubricating oil in Bangladesh:

- (i) Automobile sector
- (ii) Industrial sector
- (iii) Power Plants
- (iv) Agriculture Sector
- (v) Marine sector

The Bangladesh lubricants market expected growth is around 3% per annum

**Figure 9.** Market Share of lubricating oil in Bangladesh Contribution of Private Sector.

Marketing Companies of Bangladesh Petroleum corporation (BPC)

- (i) Meghna petroleum limited.
- (ii) Jmuna oil company limited.
- (iii) Padma oil company limited.
- (iv) Standard Asiatic oil company limited.
- (v) Eastern lubricants blenders limited (blenders only)

State owned companies are marketing the following Brands

- (i) Mobil
- (ii) BP
- (iii) Total
- (iv) Omera Lubricants
- (v) Castrol
- (vi) Lukoil
- (vii) Meghna
- (viii) Q8
- (ix) Jamuna etc.

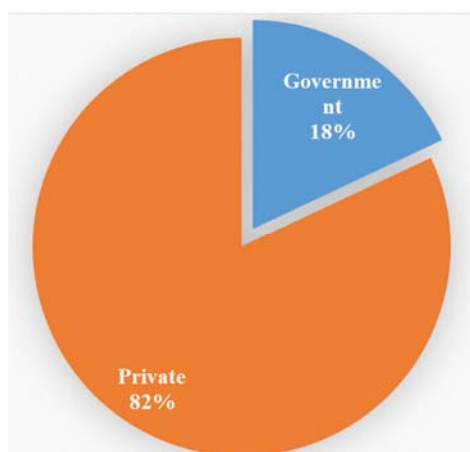


Figure 10. Contribution of Private and Public companies in Bangladesh.

Lube oil Blenders & Blending Capacity:

Table 10. Public and Private Companies Lube Oil Blenders & Blending Capacity in Bangladesh.

Name of Lube Blenders	Brand	Capacity (MT)
MJL Bangladesh Limited	Mobil/Omera	50,000
Eastern Lubricant Blenders Ltd (Public)	JOCL/MPL/POCL	25,000
Sigma oil Industries Ltd	Soil	25,000
Global Oil Co. Ltd	AP	20,000
City Oil industries Limited	Amirath	20,000
Lub-rref Bangladesh Limited	BNO	20,000
Standard Asiatic Oil Co Ltd (Public)	JOCL/MPL/POCL	18,000
Sha Aminullah Oil Agency Ltd	Boss	15,000
Lube House Limited	National	15,000
Pacific Oil Co. Limited	Sino	12,000
Lubricant Asia Ltd	Fuchs	12,000
Ric Lubricants Ltd	Kings	12,000
Al Haj Abdul Kuddus Ltd	Jl	10,000
Mega Lubricants Ltd	Mega/RFL	10,000
Oriental oil Co Limited	Orient	10,000
Min oils Ltd	Min	5,000
Total		279,000

Table 11. Contribution of Private Companies Lube Oil Blenders & Blending Capacity in Bangladesh.

Private	Public	Total
84.59%	15.41%	100%

As can be seen from the Figure and Table above, Private companies imported 82% per annum with a Capacity 84.59% of the total Lubricating Oil and the Public Companies imported 18% per annum with a capacity 15.41% Therefore, the role of private companies in the import of Lubricating Oil is very important in the energy sector of Bangladesh.

3.5. Furnace Oil

Bangladesh High Sulphur furnace oil (HSFO), 180/380 CST furnace oil is imported. The major users of imported furnace oil consume 43% of total furnace oil imports from HSFO fired power plants (5,724 MW). The Eastern Refinery limited (ERL) also produce furnace oil private power producers are allowed to import fuel oil for their own power plant consumption since 2011 & the consumption is increasing gradually.

Table 12. Public and Private Companies High Sulphur furnace oil (HSFO) Storage Capacity in Bangladesh (MT).

Public	Private	Total
75,000	356,012	431,012

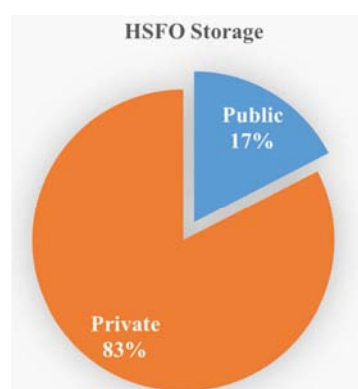


Figure 11. Contribution of HSFO storage capacity of Private and Public companies in Bangladesh.

Table 13. Furnace oil scenario of last 4 years (in Ton).

FY	Public	Private	Total
2017-2018	343129.00	1056470.85	1,399,599.85
2018-2019	274915.00	1658028.88	1,932,943.88
2019-2020	22852.00	2385007.00	2,407,859.00
2020-2021	70736.50	2623932.03	2,694,668.53

Source: HCU Data Bank

Table 14. Year-wise contribution of Private Companies Furnace Oil Import in Bangladesh.

Financial Year	Public	Private	Total
2015-2016	18.62%	81.38%	100%
2016-2017	23.69%	76.31%	100%
2017-2018	24.52%	75.48%	100%
2018-2019	14.22%	85.78%	100%
2019-2020	0.95%	99.05%	100%
2020-2021	2.62%	97.38%	100%

As can be seen from the Table above, in the Fiscal Years 2015-2016, 2016-2017, 2017-2018, 2018-2019, 2019-2020 and 2020-2021 Private companies imported 81.36%, 76.31% 75.48%, 85.78%, 99.05% and 97.38% of the total furnace oil and Public Companies imported 18.62%, 23.69%, 24.52%, 14.22%, 0.95% and 2.62%. Therefore, the role of private companies in the import of Furnace Oils is very important in the energy sector of Bangladesh.

3.6. Private Entities Bitumen, Transformer Oil, Greases & Additives

Bitumen:

Bangladesh is moving towards heavy development of industries & infrastructure for better road connectivity, new roads are under construction & the demand for good quality bitumen is increasing current annual demand of Bitumen is ~500,000 MT, out of which ~70,000 MT is supplied by ERL & rest of the amount is being imported by private companies in the year 2020, Bashundhara oil & gas, a private company, launched a Bitumen production plant, with an installed capacity of 900,000 MT per annum to meet country's growing demand of Bitumen,

Transformer oil

Private entities have also manifested their footprint in producing transformer oil locally that contribute exceedingly to the power sector of Bangladesh.

Grease

Private entities of Bangladesh also produce greases of many grades to support automobile & industrial sector of Bangladesh.

Additives

MJL also set up additives manufacturing facilities, the first of its kind in this country.

3.7. Refinery Oil

Table 15. Refinery Oil scenario of last 4 years (in Ton).

FY	Public	Private	Total
2017-2018	3796314.00	45001.52	3,841,315.52
2018-2019	3953285.00	94924.00	4,048,209.00
2019-2020	3986719.00	322667.06	4,309,386.06
2020-2021	4188558.39	156400.45	4,344,958.84

Source: HCU Data Bank

Table 16. Year-wise contribution of Private Companies Refinery oil imports in Bangladesh.

Financial Year	Public	Private	Total
2017-2018	98.83%	1.17%	100%
2018-2019	97.65%	2.35%	100%
2019-2020	92.51%	7.49%	100%
2020-2021	96.40%	3.60%	100%

As can be seen from the Table above, in the Fiscal Years 2017-2018, 2018-2019, 2019-2020 and 2020-2021, Private Companies imported 1.17%, 2.35% 7.49% and 3.620% of the total refinery oil and Public Companies imported 98.83%, 97.65%, 92.51% and 96.40%. Therefore, the role of private companies in the import of refinery oil is very important in

the energy sector of Bangladesh

3.8. Crude Oil

Table 17. Crude oil scenario of last 4 years (in Ton).

FY	Public	Private	Total
2017-2018	1079598.00	129143.80	1,208,741.80
2018-2019	1166428.00	218635.56	1,385,063.56
2019-2020	1256130.00	5995.00	1,262,125.00
2020-2021	1307261.92	123123.00	1,430,384.92

Source: HCU Data Bank

Table 18. Year-wise contribution of Private Companies Crude oil import in Bangladesh.

Financial Year	Public	Private	Total
2017-2018	89.32%	10.68%	100%
2018-2019	84.21%	15.79%	100%
2019-2020	99.52%	0.48%	100%
2020-2021	91.39%	8.61%	100%

As can be seen from the Table above, in the Fiscal Years 2017-2018, 2018-2019, 2019-2020 and 2020-2021, Private Companies imported 10.68%, 15.79%, 0.48% and 8.61% of the total crude oil and Public Company imported 89.32%, 84.21%, 99.52% and 91.39%. Therefore, the role of private companies in the import of Crude Oil is very important in the energy sector of Bangladesh.

3.9. Coal

Table 19. Coal scenario of last 6 year (MT).

Year	Public (Production)	Import (Private)	Total
2015-16	1,021,638.00	3,812,060.00	4,833,698.00
2016-17	1,160,657.81	2,801,407.00	3,962,065.00
2017-18	923,276.00	3,394,534.24	4,317,810.00
2018-19	803,315.00	5,754,025.00	65,57,339.00
2019-20	808,358.00	6,828,032.00	7,636,390.00
2020-2021	753,973.00	6,751,041.00	7,505,014.00

Source: HCU Data Bank

Table 20. Year-wise contribution of Private Companies Coal Import in Bangladesh.

Financial Year	Public	Private	Total
2015-2016	21.14%	78.86%	100%
2016-2017	29.29%	70.71%	100%
2017-2018	21.38%	78.62%	100%
2018-2019	12.25%	87.75%	100%
2019-2020	10.59%	89.41%	100%
2020-2021	10.05%	89.95%	100%

As can be seen from the Table above, in the Fiscal Years 2015-2016, 2016-2017, 2017-2018, 2018-2019, 2019-2020 and 2020-2021 Private Companies imported 78.86%, 70.71% 78.62%, 87.75%, 89.41% and 89.95% of the total coal and Public Company Produced 21.41%, 29.29%, 21.38%, 12.25%, 10.59% and 10.05%. Therefore, the role of private companies in the import of coal is very important in the energy sector of Bangladesh.

3.10. Electricity

Table 21. Public and Private Companies Electricity Installation Capacity in Bangladesh (MW) [10].

Public	Private	Total
10,339	10,044	20,383

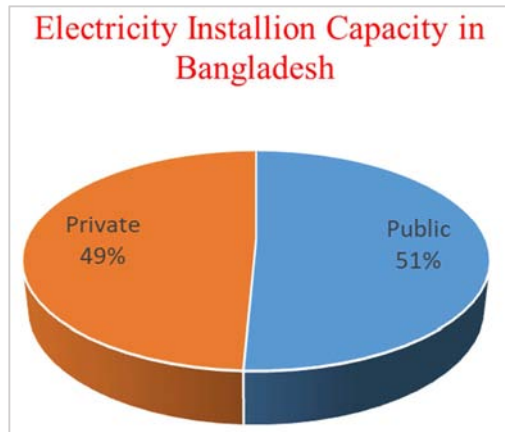


Figure 12. Electricity Installation capacity in Bangladesh.

Table 22. Electricity generation scenario of last 5 years in Bangladesh (Ghr) [10].

Financial Year	Public	Private	Total
2015-2016	22585	29608	52193
2016-2017	26597	30679	52276
2017-2018	31082	31595	62677
2018-2019	35107	35426	70533
2019-2020	35316	36102	71419

Table 23. Year-wise contribution of Private Companies Electricity generation in Bangladesh.

Financial Year	Public	Private	Total
2015-2016	43.27%	56.73%	100%
2016-2017	50.88%	49.12%	100%
2017-2018	49.59%	50.41%	100%
2018-2019	49.77%	50.23%	100%
2019-2020	49.45%	50.55%	100%

Table 24. Year-wise Maximum Electricity generation in Bangladesh (MW) [10].

Financial Year	East Zone	West Zone	Total
2015-2016	6699	2337	9036
2016-2017	7024	2455	9479
2017-2018	8034	2924	10958
2018-2019	9012	3881	12893
2019-2020	9005	3733	12738

As can be seen from the Table above, in the Fiscal Years 2015-2016, 2016-2017, 2017-2018, 2018-2019 and 2019-2020 Private companies produced 56.73%, 49.12%, 50.41%, 50.23%, and 50.55% of the total Electricity Generation and Public Company Produced 43.27%, 50.88%, 49.59%, 49.77%, and 49.45% Therefore, the role of private companies in the produce of Electricity generation is very important in the energy sector of Bangladesh.

4. Result and Discussion

4.1. The amount of Contribution of Private Entities in the Energy Sector of Bangladesh

Table 25. Contribution of Private Entities in the Energy Sector of Bangladesh in the FY 2017-2018.

Item Name	Public	Private
Natural Gas	40.11%	59.89%
LNG	-	-
LPG	2.88%	97.12%
Lubricating Oil	18.00%	82.00%
Furnace oil	24.52%	75.48%
Refinery oil	98.83%	1.17%
Crude oil	89.32%	10.68%
Coal	21.38%	78.62%
Electricity	49.59%	50.41%

Table 26. Contribution of Private Entities in the Energy Sector of Bangladesh in the FY 2018-2019.

Item Name	Public	Private
Natural Gas	38.98%	61.02%
LNG	0%	100%
LPG	2.75%	97.25%
Lubricating Oil	18.00%	82.00%
Furnace oil	14.22%	85.78%
Refinery oil	97.65%	2.35%
Crude oil	84.21%	15.79%
Coal	12.25%	78.62%
Electricity	49.77%	50.23%

Table 27. Contribution of Private Entities in the Energy Sector of Bangladesh in the FY 2019-2020.

Item Name	Public	Private
Natural Gas	36.89%	63.11%
LNG	0%	100%
LPG	1.58%	98.42%
Lubricating Oil	18.00%	82.00%
Furnace oil	0.95%	99.05%
Refinery oil	92.51%	7.49%
Crude oil	99.52%	0.48%
Coal	10.59%	89.41%
Electricity	49.45%	50.55%

Table 28. Contribution of Private Entities in the Energy Sector of Bangladesh in the FY 2020-2021.

Item Name	Public	Private
Natural Gas	33.53%	66.47%
LNG	0%	100%
LPG	0.92%	99.08%
Lubricating Oil	18.00%	82.00%
Furnace oil	2.62%	97.38%
Refinery oil	96.40%	3.60%
Crude oil	91.39%	8.61%
Coal	10.05%	89.95%

4.2. Opportunities of Investment in Natural Gas Sector in Bangladesh

Gas exploration activities need to be boosted both in onshore & offshore. Transmission & Distribution networks of natural gas are yet to cover entire Bangladesh so the natural gas transmission & distribution infrastructure will need overhauling & upgradation in next few years.

New technologies available in the international market will need to be adapted in Bangladesh (IOT, Remote Metering & internet billing). Natural gas transmission & distribution are yet to have participation from local private entities. So initiative is required for the mandatory participation of local private sector in pipeline construction, ownership, operation and maintenance. This will help to build capacity & transfer technology.

Local private entities can also engage in construction & maintenance of cross border gas pipeline. Foreign investors, in case of participation in gas transmission, have to join hands with local entities. Preference to be given to local private entities to access finance for natural gas infrastructure development. Private companies, by PPP, boot (build, own, operate, transfer) or on independent basis, can build the infrastructure required for gas pipeline network to supply natural gas to economic zones. Private companies can set up dedicated pipeline network & distribution facility for economic zones & ensure uninterrupted natural gas supply.

Private companies can also actively participate in natural gas marketing & infrastructure maintenance. In Canada privately owned companies such as perk land fuel corporation, husky energy etc. are successfully owning & operating natural gas transmission & distribution line. Bangladesh's natural gas/ pipe gas usage need to be optimized & routed to productive sectors only (power generation & fertilizer industries). The government of Bangladesh, through policy encouraging LPG for commercial, domestic & automotive segments and domestic gas connection & use of CNG need to be discouraged.

4.3. Opportunities of Investment of LNG in Bangladesh

The Bay of Bengal has rough seas during the monsoon period, this leads to interruption in supply of LNG from the

present two FSRUS. also, the government incurs capacity charge during that time. Globally, FSRU units are expensive to operate & maintain. they are used as temporary infrastructure to bridge peak gas demand and to reduce cost & to ensure consistent supply of LNG over 365 days each year, a land based LNG terminal in deep sea port is required,

However, proposed deep sea port is still in project phase & will not be operational before 2024. As a result of LNG retailing policy, private importers can import and market LNG by themselves. Private companies can find out suitable locations/lands (with riverine access) for setting up and operating small scale LNG terminals (SSLNG).

Based on capability of private companies, government should create and facilitate access to those lands. Petrobangla can buy the LNG & pass back to private companies for retailing which in turn creates revenue for Bangladesh government as well. However, the LNG import prices in different LNG terminals will not be the same (land based terminal, FSRUS & small scale). Government should address this issue while negotiating capacity cost of different LNG infrastructure proposals.

4.4. Opportunities of Investment in Petrochemical Industries in Bangladesh

Demand of industrial sectors such as automobile, electronics, construction, packing, consumer goods (cosmetic) are on the rise to produce the raw materials such as HDPE, LDPE, LLDPE, PVC, PP, BR etc., industries require various petrochemical products such as benzene, butadiene, ethylene, xylene, propylene etc. Considering the burgeoning demand of petrochemical products in Bangladesh, this industry has a strong prospect in the days to come. Therefore, setting up a petrochemical industry in deep-sea ports like matarbari and chattogram bay terminal will be a potential source of national revenue and augment the energy sector.

4.5. Fuel-wise Composition of Power Development Plan (MW) and Oil Demand and Supply Projection for Non Power Sector

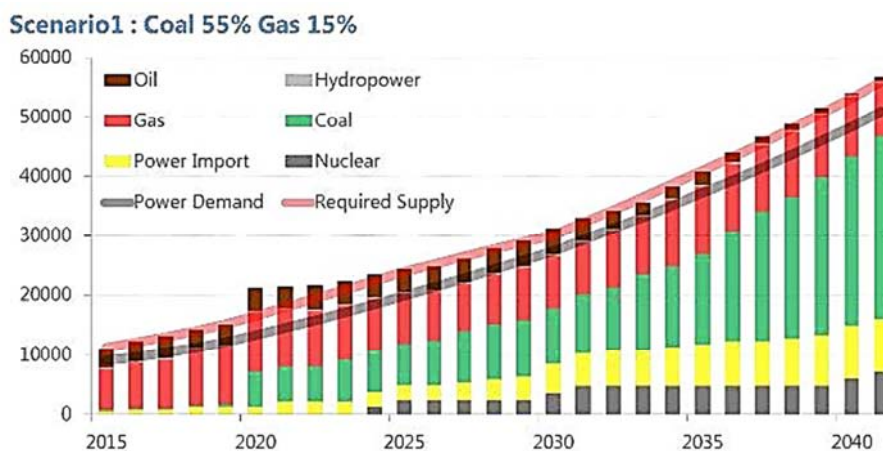


Figure 13. Fuel-wise composition of power development Plan [6].

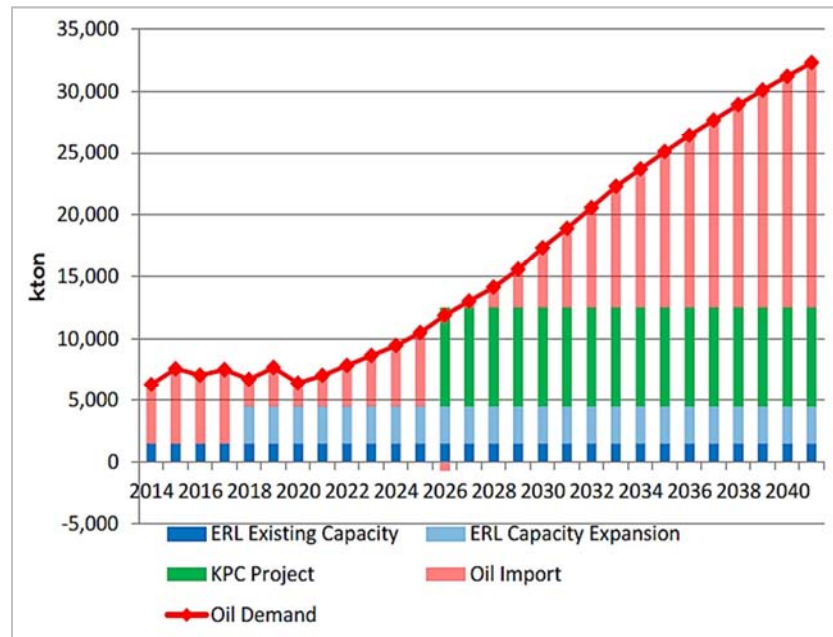


Figure 14. Bangladesh oil demand & supply projection [6].

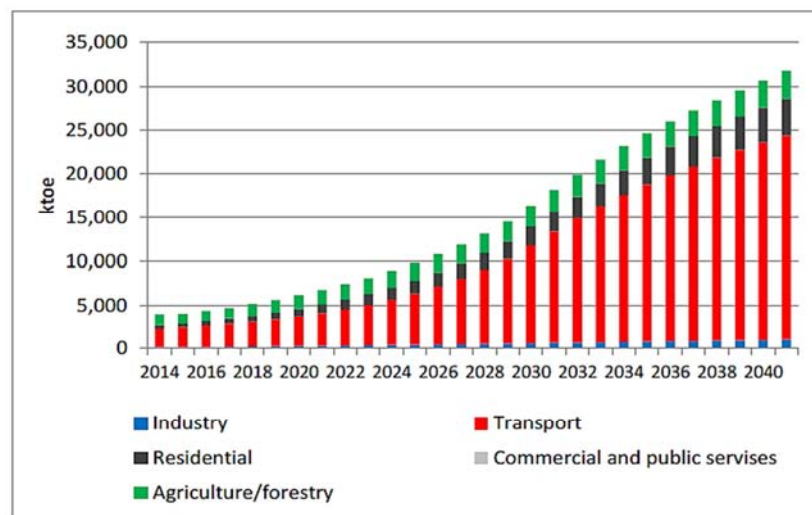


Figure 15. Oil demand projection for Non-power sectors [6].

5. Challenges Faced by Private Entities in Energy Sector of Bangladesh

Counterfeit/adulterated products have been a big concern area for the lubricants industry

- 1) Monitoring & enforcement of law for violation is mandatory
- 2) Re-cycled oil - extraction through conventional filtration of used lubricants, has to be stopped
- 3) The permission to blend & import finished products must require fulfillment of conditions like blending agreements with renowned oil companies & standardization prior to import
- 4) We have now many blenders & importers & more than 50% of the market is dominated by low end products which are damaging expensive industries & vehicles
- 5) Bangladesh is allowing to produce/market very low-quality grade which are globally obsolete (i.e., API SC/CC) since the year 1967
- 6) Multiple regulators
- 7) Duplication of Licensing fees by BERC/BPC
- 8) High import cost of raw materials for LPG cylinders
- 9) Unhealthy practices such as cross filling of LPG cylinders
- 10) Strengthening of supervision & enforcement by Department of Explosives
- 11) Unable to receive large LPG vessels due to lack of port infrastructure & low water depth
- 12) Small LPG companies (in terms of infrastructure & market share) do not maintain standard industry practices & safety guidelines

6. Conclusion

Bangladesh will have to take following steps with top priority to maintain its wheel of growth by creating adequate energy security: (i) The petroleum act 1974/ BPC ordinance needs to be unbundle/amendment; (ii) Investment at home & abroad will have to be building Hydrocarbon Reserve; (iii) Investment in infrastructure like development of deep-sea ports at matarbari (moheshkhali) & chattogram bay terminal these can be hubs for all types of liquid products import which will eventually make the product cost competitive; (iv) We need to be remain competitive in production & service sector; (v) Petrochemical import terminal need to be set up for the production of chemicals such acetone, phenol, xylene, toluene, methanol; (vi) Must allow import & distribution of petroleum products.

7. Future Recommendation

- 1) The minimum standard API grade should be set for:
 - a. gasoline engine: SG/CD
 - b. diesel engine: CF/SF & gradually upgrade it to the global standard
- 2) Strong enforcement of the law to stop counterfeit/adulteration through mobile court/regulatory control authority
- 3) Policy Reform of Lubricant Market
- 4) Policy is required on proper collection & disposal of used lubricants to protect the environment & counterfeit products
- 5) Recycled/used lubricants must be banned for use as a lubricating oil
- 6) Adulteration of Lube oil segment should be strictly regulated & used oil should be managed properly concerning environmental safety issues.
- 7) Import, blending & marketing of lubricating oil higher than SAE 50 viscosity engine oils must be fully prohibited
- 8) SPM (single point mooring) has to be set up to get imported crude oil without lighter age
- 9) In order to avail good prices in the market, government of Bangladesh can buy crude oil 50% through g2g & 50% through private entities by tender
- 10) Rehabilitation & expansion of our refinery to raise its production capacity
- 11) Currently, the BPC has a total storage capacity of 1.31 million tons of liquid petroleum products, which include diesel, furnace oil, petrol, octane, kerosene, bitumen, condensate, crude oil, etc.
- 12) Government should allow storage terminals to import finished products
- 13) Government should provide full policy support to LPG industry
- 14) High import cost of raw materials for LPG cylinders should be reviewed
- 15) Unhealthy practices such as cross filling of LPG cylinders should be regulated

- 16) Enforcing supervision of government organizations such as department of explosives, etc. to control industry mal practitioners
- 17) Framing of national policy guidelines for reducing dependency on usage of natural gas & to encourage use of LPG in domestic, commercial & industrial segments
- 18) Framing of a new policy for pass through of LPG cost to promote LPG fired power plants
- 19) Port development targeting effective & efficient functional Import & Export facilities
- 20) Ensuring energy security for the manufacturers & reviewing energy prices
- 21) Abatement of usage of fossil fuel & ensuring the incremental growth of clean & modern energy for all
- 22) Development of LNG grid pipeline for receiving full capacity from FSRU
- 23) Investment of private entities (local) in national pipeline grid may be considered

Acknowledgements

I would like to thank Mr. Shihab Mahmud, Assistant Director (Reservoir & Production), Hydrocarbon Unit, Energy and Mineral Resources Division, Ministry of Power, Energy and Mineral Resources, Bangladesh for his kind support and cooperation.

References

- [1] Updated Asian Development Outlook (ADO) (September 2020), Asian Development Bank.
- [2] Asian Development Outlook (April 2020), What drives innovation in Asia, Asian Development Bank.
- [3] World Economic Outlook (2020), International Monitoring Fund (IMF).
- [4] National Accounts Statistics Provisional Estimate of GDP 2020-2021 and Final Estimate of GDP 2019-2020; Retrieved from <http://www.bbs.gov.bd/site/page/dc2bc6ce-7080-48b3-9a04-73cec782d0df/GDP>.
- [5] Annual Report on Export Promotion Bureau (2017-2018) Ministry of commerce, Bangladesh, Retrieved from http://epb.gov.bd/site/view/epb_export_data/-.
- [6] Power System Master Plan (2016), Bangladesh Power Development Board, Power Division, Ministry of Power, Energy and Mineral Resources, Bangladesh.
- [7] Imam Badrul. "Energy Resources of Bangladesh" 2nd Edition, 2013.
- [8] Gustavson Associates, LLC, (2010), Updated Bangladesh Gas Reserve Estimation, 328-329.
- [9] Monthly Report on Gas and Coal production (2021) Hydrocarbon Unit, Energy and Mineral Resources Division, Ministry of Power, Energy and Mineral Resources, Bangladesh, 1-2.

- [10] Annual Report on Bangladesh Power Development Board, (2020) Power Division, Ministry of Power, Energy and Mineral Resources, Bangladesh.
- [11] Raut, Nirmal Kumar (2020), A Review of the Economic Impacts of the COVID-19 Pandemic and Economic Policies in Nepal of Retrieved from <https://mp.ra.ub.uni-muenchen.de/102778/>.
- [12] Monthly Report on MIS Petrobangla, (2020 &2021) Energy and Mineral Resources Division, Ministry of Power, Energy and Mineral Resources, Bangladesh.
- [13] Annual Report on Bangladesh Petroleum Corporation, (2020) Energy and Mineral Resources Division, Ministry of Power, Energy and Mineral Resources, Bangladesh.